

Status of North Vietnam's Electric Power Industry  
May 1965

Summary

Air strikes against electric power facilities in North Vietnam have put out of operation about 131,000 kilowatts (kw) of power-generating capacity, or 70 percent of the national total. Loss of generating facilities has created a severe shortage of power with consequent disruption of activities that normally depend on a reliable central power supply, particularly in the small modern industrial sector of the economy. It is unlikely, however, that loss of electric power has materially affected economic operations closely associated with the war effort. For all practical purposes, power supply to non-essential consumers has been eliminated. Imported diesel-driven equipment will offset only a small part of the loss, and rationing of remaining capacity appears to be a necessity.

Results of Air Strikes

Since April 1965 air strikes against central power-generating facilities in North Vietnam have put out of operation 131,000 kw of capacity in the main Hanoi-Haiphong power network and in two smaller power systems in the southern part of the country. The loss represents 70 percent of total national installed capacity of 187,000 kw. The cost of restoring these facilities is estimated at \$20.5 million.

Cumulative damage to central generating facilities has reduced serviceable capacity in the main network from eight plants with a

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total capacity of 136,000 kw to a single plant at Hanoi with a capacity of 32,500 kw, or about 24 percent of the pre-strike level. Severe damage has been inflicted on powerplants at Dong Bi, Hon Cai, Haiphong East, Haiphong West, Thai Nguyen and Viet Tri. Restoration times for partial operation of these plants varies from one month to a year, and complete restoration in most instances will require one year or more. (See following tabulation)

Plant Name	Capacity (kilowatts)	Date of Most Recent Damage	Estimated Months of Restoration Time	
			For Partial Operation	For Complete Restoration
Dong Bi	24,000	Aug 66	6	24
Hon Cai	15,000	Mar 67	4	18
Haiphong East	7,000	Apr 67	12	18
Haiphong West	10,000	Apr 67	2	24
Bac Giang	12,000	Apr 67	3	6
Thai Nguyen	24,000	Mar 67	4	18
Viet Tri	16,000	Mar 67	4	18
Dong Anh Substation	N.A.	May 67	2 to 3	6
Nam Dinh	7,500	Aug 65	2 to 3	12
Thanh Hoa	5,000	Sep 66	1 to 3	18
Ban Thach	1,000	Aug 65	Reconstr. abandoned	12
Co Dinh	1,500	Nov 66	Reconstr. abandoned	12
Ben Thuy	8,000	Oct 66	1 to 3	18

Damage inflicted by strikes on the Dong Anh substation, the most important substation in the network, will prevent integrated operation of the network for at least 2 to 3 months. An additional powerplant at Bac Giang, which is outside the main network, was put out of operation for a minimum of 3 months.

In addition to the main network, central powerplants in the southern part of North Vietnam also have sustained damage. Currently

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all four plants in the small power systems around Thanh Hoa and Ban Thuy are out of service from damage inflicted during 1965-66. Construction activity at two of these plants, however, indicates a partial operational capability within the next few months.

#### Cumulative Effects

Loss of the generating capacity at Hon Gsi, Ung Bi, Thai Nguyen, and Viet Tri has eliminated the supplementary supply of power formerly received by Hanoi and Haiphong from the main transmission network. Hanoi now is dependent on one local powerplant with a capacity of 35,500 kw that is believed capable of supplying about one-half of the city's normal needs. Haiphong is without a central power supply and must rely on available diesel-generating equipment, plus a possible small amount sent via transmission line from Hanoi. (See attached map)

The degree of curtailment in the electric power supply is difficult to quantify. It is possible that non-essential consumption by residences, commercial establishments, and street lighting has been eliminated. Curtailment of power supply for industry almost certainly has caused fragmentation of industrial processes in some cases, and in other cases has caused complete shutdown. The few heavy or continuous-process industries, such as the Viet Tri chemical and paper complex or the Haiphong cement plant, probably will be forced to stop operations unless some provision for power has been made by the installation of diesel-generating units larger than those currently

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estimated to be available. No ready substitute for industrial process-steam is available to industries formerly dependent on steam furnished by the central powerplants. Industrial or manufacturing processes that can be divided into small segments (such as machine shops, truck repair facilities, coal mining, or port loading operations) can probably be furnished sufficient power by small diesel generating units, but not without some loss of efficiency.

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powerplants. The first definite indication that generating capacity now falls short of meeting demands was a reported announcement that power rationing was instituted in Hanoi on 10 May 1967. Other reports suggest intermittent restrictions on power supply over the past year, but do not apply to the period of recent strikes against power facilities, February-April 1967.

Considerable variation in the progress of reconstructing power facilities has been observed over the past 18 months. Where limited damage permits equipment to be readily salvaged the North Vietnamese have demonstrated persistent efforts to restore facilities to partial operation. Some evidence indicates that they are willing to abandon plants which require major reconstruction.

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Imports of Diesels

It is not likely that diesel-driven generating units imported by North Vietnam can be used to alleviate significantly a general shortage of electric power. The diesel units imported are well-suited for supplying power to small independent consumers, but they cannot be readily operated in parallel with a transmission network, nor are they large enough to cover the demands of heavy, continuous-process industry.

North Vietnam is believed to have imported around 2,000 diesel-driven generating units during the past two years. The largest units imported were two with a capacity of 600 kw each from the USSR, fifteen with a capacity of 320 kw each from Czechoslovakia, and an unspecified number of 500 kw units also from Czechoslovakia. The remaining units imported have capacities ranging from 5 kw to 100 kw, with about 75 percent having capacities of less than 20 kw. The aggregate capacity represented by nameplate ratings of equipment known to have been imported amounts to an estimated 25,000 kw to 30,000 kw.

supplied independently to separate consumers each consumer maintains reserve capacity. Moreover some consumers will be assigned generating units larger than needed. Dispersal of consumers and formation of independent power supply thus will diminish the capability

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of diesel units to offset an equivalent amount of central generating capacity. The diesels known to have been imported probably could not supply more than 15,000 kw to 20,000 kw of usable power. This amount is roughly 10 percent to 15 percent of the central generating capacity currently out of operation.

Virtually nothing is known about the location of diesel units. However, it is reasonable to assume that some units have been allocated for use in the areas of Thanh Hoa, Ben Thu, and Hou Cai where central plants are out of operation. Some undoubtedly have been assigned to supply power for irrigation and drainage of agriculture, and some will be assigned a standby role for emergency power. Although a number of alternatives are open to the North Vietnamese in the use of diesels, it seems clear that available generating capacity falls far short of meeting demands, and that rationing of electricity will be a necessity.